

ABSTRACT OF THE DISCLOSURE

Supermolecular structures and devices made from same. Semiconductor materials and devices are manufactured and provided which use controlled, discrete distribution of and positioning of single impurity atoms or molecules within a host matrix to take advantage of single charge effects. Single-dopant pn junctions and single-dopant bipolar cells are created. Each bipolar cell can function as a bistable device or an oscillator, depending on operating temperature. The cells can be used alone or in an array to make useful devices by adding an insulating substrate and contact electrodes.